Mircea Digulescu

Achieve your full potential ...

Presentation of Mircea Digulescu and his Proposals

Mircea Digulescu is an **Independent Entrepreneur**, **Leader**, **Computer Science Researcher**, **Software Engineer**, **Intelligence Enthusiast** and **Amateur Writer**. He is currently looking for partners to contract his services and investors to finance his projects. He is also interested in bilateral and multilateral scientific cooperation (in a private capacity), as well as offering trainings.

He is originally from Bucharest, Romania and currently operates worldwide.

He has a **PhD (ABD) in Applied Computer Science** from **University of Bucharest** (2019), Faculty of Mathematics and Computer Science, where he also taught briefly (2014), and was awarded the **Professional Diploma in Management (with Distinction)** by the **Open University Business School (OUBS)** in Milton Keynes (distance learning) (2008). He also completed several other graduate and post-graduate courses, including Russian Language for Foreigners from **Lobachevski State University** – 1 semester (2019), Competitive Negotiation Strategy - **Moscow School of Management SKOLKOVO** (2013), International Strategy - OUBS (2011) and was offered admission but did not attend **Moscow School of Management SKOLKOVO** (in 2012) and **Cornell University** (in 2004).

Mircea Digulescu is a former laureate of the toughest, most renowned international Informatics contests for University students and high school pupils (**CEOI 2003, 2004; ACM SEERC 2004, 2005**) and is also a **Div1 coder on Codeforces.com** (profile: **mircea85**) – peek score 2022 **candidate master**.

He self-published a number of papers on topics of Computer Science – mainly **Game Theory** (like *Farsighted Stability in Stable Marriage Problem*), **Complexity Theory** (like *Towards Solving NP-Complete and Other Hard Problems Efficiently in Practice*) and **Cryptography** (like *Hiding Data in Plain Sight: Towards Provably Unbreakable Encryption with Short Secret Keys and One Way Functions*) – some of which have been favorably informally peer-reviewed by a number of researchers. He also self-published a number of articles on social awareness and strategy pertaining to the topic of designing and enacting a better society: eg. **On the Functioning of Society** (2019), **On Happiness** (2015), etc.

Mircea Digulescu **founded an RPA technology startup** (Mat Soft Technology) in 2009 which he sold in 2014. He worked on various other projects in the field of software engineering, with roles varying form **Senior Software Engineer** to de-facto **Director of Engineering** (Engineering Manager officially) to **Technical Product Manager**, mostly freelance. Up to Feb 2021, he never earned money from anything other than software engineering in his entire existence.

Mircea Digulescu has some experience working with international actors, which he gained by travelling around on business trips for his former startup and then to try to raise funds.

Mircea Digulescu is a **fully independent, non-state actor**. All his non-software endeavors were and are self-financed. He maintains himself aware of the problems and situations across most regions of the globe,

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by individually processing OSINT (especially NEWSINT) and the occasional, opportunistic HUMINT he obtains via his personal contacts with others. When he was young (9-14 yo.), Mircea Digulescu developed the system of functional "secret service" where he co-opted some of his school colleagues at the time (1995-2000) – see photo docs here. He has self-perfected his knowledge and competence in intelligence gathering and operations ever since. He considers himself an Intelligence Enthusiast.

As a **Software Engineer** he builds **fast, reliable systems that scale**. He built a Google Maps competitor for Bolt.eu which is currently live in production and serves around 100 Million monthly active users and over 1 Billion transactions. He can build systems of larger scale as well.

As an Entrepreneur, Mircea Digulescu proposes 8 ideas for new startups, including a Marketplace, a Cryptography company and Private Cloud. He had his own RPA (Robotization Process Automation) BPMS startup, MAT Soft Technology during the period 2009-2014. He is currently looking for investors and customers for these 8 new startups.

He speaks Romanian (native), English (bilingual, certified by SAT1+2, TOEFL), Russian (medium, ~B1), German (low), French (very low).

Mircea Digulescu is actively looking for partners to:

1. Contract his **strategy / intelligence consultancy** services.
2. **Invest in or become customers of his future tech and consultancy startups**.
3. **Help attract investment** and **partner with him** in his future tech startups.
4. Contract his **software engineering and management** services or pay him for **end-to-end R&D of software and non-software projects**.
5. Finance his activities in **Computer Science Research**.
6. Contract training and teaching services from him, particularly in the fields of **computer science** and **software engineering**.
7. Engage in **direct cooperation** with him.
8. Popularize his works, especially **scientific papers** as well as his belletristic works as an amateur writer. This includes translations.
9. Contract Mircea Digulescu to **lead private and public organizations**.

Contact Mircea Digulescu directly for any of the above opportunities: mircea.digulescu@gmail.com (preferred); mircea.digulescu@matsoft.ro;

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The reminder of this document details the portfolio of projects and activities conferring Mircea Digulescu the credentials to offer a successful cooperation in each of the above categories.

The concrete details of types of products, services and companies being proposed are briefly detailed as well. Contact Mircea Digulescu directly for any additional information and pricing.

Some of the credentials for one of the 8 categories apply to others. It is recommended to read this document in its entirety.

1. Intelligence and Strategy Consultancy by Mircea Digulescu

Mircea Digulescu has a passion for some activities in the information and strategy sphere. His self-developed and practical experience might thus sometimes out-perform that of some established entities.

The single most important contribution that Mircea Digulescu can bring is setting up and operating as part of a **strategic think tank** offering deep, useful, actable insights and creative solutions and approaches to concrete problems and operations facing decision makers and fellow strategists. Additional proposals for specific cooperation include but are not limited to the following areas:

- **Resiliency by Design.** Building and offering insights into how to create the Structures, Systems and Culture of Organizations and how to scheme them with personnel so as to make them by design – game theoretically – hard to compromise via cooption and infiltration and also how to enable them to function effectively.
- **Operations**. Anticipating strategies of adversaries. Analyzing and evaluating treason risk, uncovering infiltrators and agents foreign to some organization. From individual experience and leveraging Game Theory background this can be particularly effective when countering the western methodology of infiltration and compromise. Competitive negotiation support.
- **Cryptography, Information Security and IT Operations**. Mircea Digulescu is quite knowledgeable about Cryptography and has invented a novel type of symmetric key cryptographic system himself (see the cryptography part of section 4 below). Other schemes in pipeline include a novel Symmetric Key Authentication scheme over a public channel (with zero leaked knowledge), FoF identification, digital signature systems and cryptographic chain of command authorization systems. Information Security and ITOPS are also in scope.
- **C4I IT Systems**. Developing software system to control aid and generate insights pertaining to C4I operations and maintenance of critical infrastructure in working order. Developing modules or offering services related to such.
- **Technical Software**. This is software that runs on embedded, forward deployed hardware.

Cooperation in this sphere can take the form of on-demand or revolving contracts, public speaking, trainings, compiling reports and recommendations and leading concrete projects to completion.

Portfolio of past activities pertaining to Intelligence, Strategy, Diplomacy and State Relations:

- **Better World Project** (2012-present): Comprehensive writings pertaining to understanding current social and political realities, dismantling common myths, thinking freely and openly about the nature and requirements of a better future society and developing strategies for change, education and solidification of the future society. Main emphasis is on educating capable youths into understanding their reality and gaining competences for living. So far: On The Functioning of Society, On Happiness, On Liberty, On Morality, On Power and On Democracy (in Romanian). Available here and here.
- **Romania Informata page – Romania Informed** (2013-2020): Media project to disseminate news and articles on functioning of society and power. See here: https://www.facebook.com/RomaniaInformata/. In Romanian. Was closed by Facebook in 2020.
- **Independent Speaker** on entrepreneurship and other topics (2012-2015): National Student Congress 2012, Softbinator Conference 2012, engagement with Union of Romanian Students (federation of Romanian associations of students) and others.

Besides the above, I had intermittent low-level contacts at events and conferences with various groups from Romania and abroad. For example, a round table on the involvement of Romanian Entrepreneurs in the reconstruction of Syria (2019). Additionally, I attended the China-CEE Summit and a RoChina business conference (2013-2014).

Experience in International Relations and Cooperation:

- **International Forum (2020)**. Expressing my views and offering a rather blunt and strong speech about secretive elites. Speech available intermittently here. The speech contained a game theoretical ploy (strategy) for combating these elites and making people less likely to defect to them, while encouraging defections from them. A true game-changer strategy, developed from scratch!
- **Engagement with the Embassy of the Russian Federation in Romania (2016-present)**. Attended several events – Russian National Day Celebrations 2018, a series of cultural events, maintained some level of cultural contacts with Russian diplomats stationed in Bucharest and attended a Q&A session in 2019. Was connected with my learning Russian language at the Russian Center for Culture and Science.
- **Attended IASP 2016 Moscow.** This is an annual conference where heads of Science and Technology Parks and Areas of Innovations from around the world meet.
- **Romania – Russian Federation Trade Mission, Moscow (2011)**: Trade mission from the Bucharest Chamber of Commerce to the Moscow Chamber of Commerce. Representing my own software startup and calling for deepening cooperation with Romanian independent entrepreneurs. No concrete talks or agreements.
- **Romanian Trade Mission to the People's Republic of China (2010).** Visited Shanghai and Hangzhou representing my own software startup as part of some trade group of some sort (was invited by Bucharest Chamber of Commerce). Briefly met with some local Chinese officials. No concrete talks or agreements.
- **Romanian Trade Mission to Egypt and Morocco (2010).** Again representing my own software startup. Was invited by some friend of a friend. I met some folks from the Bucharest Chamber of Commerce during this time. They later invited me to join their pro-western secret society, but I refused. Met with some regional entrepreneurs and officials at a part at the Romanian Embassy in Cairo. No concrete talks or agreements.

2. LEADERSHIP SERVICES BY MIRCEA DIGULESCU

Mircea Digulescu is both a leader and a manager. He is particularly talented in inspiring and "putting together" groups of smart people. He can also communicate effectively across several different echelons of smartness and awareness on life and world affairs.

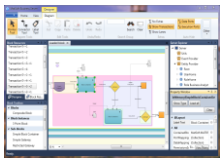
Proposals for Leadership Services include:

- **CEO, Board, VP and the like**. Proactively leading organizations small or big, setting up and enacting effective strategic direction in accordance with client's goals.
- **Executive Advisor**. Serving in an Advisory decision support role, on a strategic as well as operative level (for a concrete operation). Improving quality of decisions, discovering creative alternatives to hard problems and effectively communicating and gathering stakeholder support for decisions. Following through and verifying their enactment.
- **Offering trainings and consultancy of a general or specific nature**. Sharing best practices and educating others on how to approach and handle different situations, both actual and prospective. This task can be performed with or without access to secret information.

Mircea Digulescu has held a number of leadership and managerial roles in his professional career. While the portfolio below speaks for itself, it is less than ¼ of 1% of the potential capacity for leadership that Mircea Digulescu can manifest. The situation is such because, having been born and living for a long time in Romania, due to the socio-political context, he was never entrusted with a significant role.

Mircea Digulescu's leadership portfolio and credentials include:

- **Founder, CEO and CTO of Mat Soft Technology** (2009-2014). Raised 165k euros (from 500k euro initial promise) at a $2.5M valuation from distant relative of his, a Romanian business man and, together with his own funds, created the company in 2009. The startup aimed to offer a



private cloud infrastructure, on top of which a business process automation engine (BPMS) can be run and operated. From a commercial perspective this was a Robotization Process Automation (RPA) company in present day terminology. See details about the product and the phase to which it was bought here: http://www.matsoft.ro/index.php?sectionId=108. In 2012, the investor terminated financing being generally obscure as to reasons. Leading Mat Soft Technology involved functioning as both CEO and CTO (having invented the platform and algorithms of the underlying technology) and leading a team of 4-9 elite software engineers as well as handling stakeholder relationships and legal matters. After Mircea Digulescu sold his company to investor in 2014 for 1 euro, the idea was picked up and successful developed by Romanian "unicorn" UiPath.

- **Director of Engineering. Leading the Bucharest Engineering Office of Bolt.eu and growing it from 3 to 23 people senior engineers** (2018-2019). Bolt.eu (then Taxify) is the European ride-hailing and on-demand tech services provider, competitor to the US Uber and Lyft. The official title was Engineering Manager, but the effective work was that of Director. Leadership involved some elite technical contributions (solutions) as well (see Section 3 below), but included holding 1-1 meetings, screening candidates via interviews, performance management and evaluation, appraising migration and other risks for each office staff member, having technical meetings and maintaining relations with the corporate parent (including status updates) remotely via the Head of Engineering. I earned 17.000 Euros / month while working with them.
- **Vice President of Technical Product Management with DevFactory** (2018 and 2020). DevFactory is a large IT conglomerate which is a terminus points for many small startups which fail to self-sustain. The role involved discovering, fixing and improving the technical architecture of the products of such companies and finding ways to integrate them into existing portfolio. Work was of an elite level (moderate technical depth though). This was a leadership role because it involved working in an advisory role to company CEO and President, as part of a team. I earned $16.000 USD / month while working with them.
- **Product Manager with SIVECO Romania** (2005-2006). This was my second job at my first employer (20-21 yo). Starting as a software engineer, I was quickly noticed by VP of Engineering and Execs of SIVECO Romania and moved into a semi-leadership role: I owned the technical roadmap of the Business Intelligence and Analytics (OLAP) product of the company. They also used me to do presales and to fix stuff before customer acceptance for big budget gov't contracts, like The National Bank of Romania and the romanian National Health Inssurance House, as well as pitch the product to private companies on the Romanian market at the time, like Accelor-Mittal group (Steel), Romanceram (Ceramics), Velpitar (bakery) and others. While they made quite some money from me, I was not close to any leader there and was not involved in sharing profits. I earned 700 euros / month while working with them.
- **Professional Certificate in Management, The Open University Business School** (2005-2006) – distance learning, via Codecs. Learned MBA and Management (undergraduate level). Was quickly remarked and courted by the non-gov't secret organizations for the first time.
- **Professional Diploma in Management, The Open University Business School** (2007-2008) – distance learning, via Codecs. I continued my MBA studies at a postgraduate level and completed the program with Distinction (top <5%). Course involved both individual work, tutor marked assignments as well as brief in-person meetings in Bucharest and Brussels for residential schools.
- **Moscow School of Management SKOLKOVO** (2013). Was offered admission for fulltime MBA program but did not join since it was terminated the same year and also required 60k euro payment. I did have the opportunity to take an interactive demo course for Competitive Negotiation with renowned Israeli lecturer Moty. Application process took place 2010-2012.
- See further relevant details in the Summary and Sections 1 (above) and 3 (below).

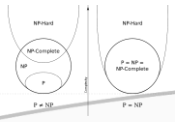
3. COMPUTER SCIENCE R&D AND TEACHING BY MIRCEA DIGULESCU

Mircea Digulescu is an independent researcher in Computer Science. He never got financing for his activities, but is **actively looking**. His interests and publications are detailed below. He would like to identify partners to **finance research and development** up to products in each of the following areas:

- **Cryptography**. Mircea Digulescu is keen on Cryptography and has invented a novel cryptographic scheme based on a new technique he calls entropy enhancement. While not a mathematician, he is knowledgeable about the workings and fundamental security assumptions of most cryptographic schemes and protocols today. Also he is insightful about implementing and using cryptographic systems securely, avoiding common pitfalls like timing attacks, using low-entropy seeds, dictionary-based edit-distance attacks, using compromised machines to enter the secret key and more.
    - In Pipeline: ***Functional Encryption: Turing-complete computation over encrypted data using SKREM-like ciphers*** (~2025?). The aim is to allow computations of arbitrary algorithms for a registry machine (which is Turing complete) over encrypted data, without knowing the decryption key. This would allow for scenarios where data can be uploaded to the Cloud in encrypted form, the cloud can perform some advanced operation without revealing the algorithm to the user, and finally send back the result to the user also in encrypted form. As a result, the Cloud processor never learns the data it processes, and also the end-user never learns the details of the advanced algorithm used. This idea is in development.
    - In Pipeline: ***Light Reading on Cryptanalysis: automating breaking of substitution ciphers and recognizing plain texts*** (~2023). The purpose is to build a system which takes as input a text encrypted with a substitution cipher and efficiently outputs the plain-text. As ciphers become ever more sophisticated, this can be useful in brute force attacks on more sophisticated encryption, in cases where not enough of the original plain text is known. Ideas for the paper have been fully developed.
    - In Pipeline: ***Irrefutable One-Time Cryptographic Digital Signatures based on SKREM-like ciphers*** (~2022). Signing short documents with a priory published, one-time public key, without making use of public key cryptography. This can be used to sign transactions on a block chain. Ideas for the paper have been fully developed.
    - In Pipeline: ***Multilateral Secret Agent Recognition, Authorization and Coordination over a Public Channel based on a Shared Secret Key*** (~2022). Introduces a symmetric-key protocol for secret agents on the field to recognize each other over a public, monitored channel by simultaneously proving to each other knowledge of a shared secret, with zero-knowledge about it leaked to other observers on the channel. It also allows them to prove their rank to the most senior one on the field, without revealing it to others of lower rank than themselves. They can then also use this scheme to coordinate actions secretly. Unlike other schemes which rely on public key cryptography with prime factorization at its core making them vulnerable to attacks by quantum computers, this scheme relies on security of SKREM-like ciphers which are not vulnerable to quantum attacks. Ideas for the paper have been fully developed.
    - In Pipeline: ***Secure Coin Flipping and Cryptographic Commit Protocol based on SKREM-like ciphers*** (~2021). Allows agents to commit to choosing a certain number without revealing it upfront. This in turns allows secure coin flipping. Unlike existing schemes whose security relies on prime factorization at its core, this scheme relies on security of SKREM-like ciphers. Ideas for the paper have been fully developed.
    - In Pipeline: ***Super Simplified SKREM: Practicalizing Unbreakable Symmetric Key Encryption with Short Secret Keys*** (~2021). Introduces a simplified, practical variant of SKREM ciphers, based on the paper below, which has better algorithmic performance characteristics (number of random bits required, running time and memory complexity). Ideas for the paper have been fully developed.

- Completed: **Hiding Data in Plain Sight: Towards Provably Unbreakable Encryption with Short Secret Keys and One Way Functions** (2019 December). Introduces a novel symmetric key encryption scheme based on a technique of entropy enhancement based on the theory of algorithmically random sequences, by requiring up-front a large master table of random bits. Unlike existing schemes, it does not rely on the hardness of algebraic operations (such as the algebraic field inverse) but instead on that of indirection based on a random sequence. This scheme is called SKREM and is claimed to be *provably* unbreakable. See here or here.
- Existing Topics Known: AES (Rijandel), RSA, El-Gamal, Kerberos as well as basic Quantum Cryptography, Kolmogorov Extraction, Algorithmically Random Sequences, SHA, MD5, Merkel Trees, elementary Functional Encryption, interactive proofs.

- **Complexity Theory and Computability**.
  - In Pipeline: ***Building Hard Cases for Hard Problems*** (~2024). Discover (perhaps automatically) cases for hard problems which cannot be easily solved using the techniques of the 2022-2024 papers or any other approaches.
  - In Pipeline: ***How Intractable is Intractable: Solving Kolmogorov Complexity on the finite case*** (~2024). Discover (perhaps automatically) an algorithm which proves Kolmogorov complexity of short strings (up to 128 bits long? Or maybe 1024?) – or at least conveniently bounds it. Based on the techniques of the 2019-2023 papers.
  - In Pipeline: ***Automatic SAT Solver*** (~2023). Discover (perhaps automatically) and a better 3-CNF-SAT solver than those in existence, based on the ideas presented in the 2019 paper.
  - In Pipeline: ***Automatic Algorithm Finder*** (~2023). Refine and Implement the techniques from the 2019 paper to produce an algorithm which finds algorithms to solve hard problems. How fast will it find KMP, constant time 32- and 64- Bit Counting or A*? How about a good algorithm to efficiently factor 50 digit numbers?
  - In Pipeline: ***Exact 3-CNF-SAT solver when there are many solutions*** (~2022). Exploiting the fact it is known that there are many solutions to a 3-CNF-SAT expression, finding one should be faster than in the general case.
  - Completed: **Towards Solving NP-Complete and Other Hard Problems Efficiently in Practice** (2019 November). Introduced the field of Finite Algorithmics: reasoning about problem difficulties for bounded inputs. Offered ideas and approaches for automatic and computer-aided discovery of algorithms for hard problems, on the finite case. Presented concrete directions for solving 3-CNF-SAT, Kolmogorov Complexity and Prime Factorization. See here or here.



  - Completed: **Nondecidability of Halting Problem – a Personal Proof** (2013 September). Constructed a paradoxical computer program proving that there is no general-case solution for the Halting Problem. See here.
  - Existing Topics Known: Finite Automata, Push Down Automata, Theory of Computing, Amortized Analysis, Master Theorem, Akka-Bazzi method, Intractability, Complexity Classes, NP-Completeness, Arithmetical Hierarchy, Quantum Computing, P-Spiking Systems, Bioinformatics (wrt Computability), Random Turing Machines, etc.

- **Game Theory**.
  - In pipeline: ***Collusion with Binary Objectives in the Stable Marriage Problem*** (~2023). Continues the exploration of the 2021 paper, with a slightly modified objective function: the boys can either get a particular match or better or otherwise they are fully indifferent as to their individual outcome. Ideas for the paper have been almost fully developed.
  - In pipeline: ***Resiliency by Design: Using Game Theory to structure organizations to withstand infiltration and treason*** (~2023). Addresses how to structure organizations into groups

and loyalty thresholds based on individual outcome and trust in order to withstand poaching and infiltration. Idea is in development.

- In pipeline: ***War Games: Withstanding and Winning Protracted Conflicts using Game Theory*** (~2022). Deals with the concept of balancing production and spending with active military operations in order to withstand and win conflicts spanning a long period of time (such that war material is constantly being produced and churned). Idea is in development.
- In pipeline: ***Mosquito Drone Strike: Attack and Defense versus a Swarm of Drones*** (~2022). Expands upon the paper below to deal with the case where missiles can travel backwards in space. Idea is in development.
- In pipeline: ***Hold the Line: Missile versus Interceptor duels and the k-servers problem*** (~2022). Deals with identifying the best strategy for a massive missile attack and the corresponding best response on the defense side. Idea is in development.
- In pipeline: ***Survival and Prosperity: Multi-Currency Investment Strategy with forced spending*** (~2022). Deals with determining the optimal strategy for reaching an objective over a period of time starting with an initial capital across multiple currencies and choosing the most adequate investments for this purpose. Idea is in development.
- In pipeline: ***Threats and Bribes in the Stable Marriage Problem*** (~2021). Expands upon the 2019 and 2016 papers to the case where boys are willing to take risks of a worse outcome in order to issue ultimatums to one-another before game play so as to obtain a better match in case their threats work. Paper discusses the general structure of this new ultimatum problem and proposes an algorithm for identifying a reasonable strategy under a specific model. Ideas for this paper have been fully developed.
- In pipeline: ***Applications of the Stable Marriage Problem*** (~2021). Introduces a series of problems which can be formulated appropriately in terms of Stable Marriage Problem, including the likes of Vendor versus Contracting Authority, where an oligopoly of vendors colludes to get the best prices and projects from a number of accepting customers. Ideas for this paper have been fully developed.
- Completed: **Weakening Nuclear Posture can result in added security** (2019 Feb). Brief note on how certain combinations of doctrines lead to war, while weakening that of just one actor can result in peace. See here (in Romanian).
- Completed: **Farsighted Collusion in Stable Marriage Problem** (2019 May). Presented an efficient algorithm for computing the unique farsightedly stable boy-optimal matching in the Stable Marriage Problem. Also criticized earlier work pertaining to the subject and presented a few connected interesting results. The large body of the work is an independent rediscovery of results by Jun Wako (2010), adding upon them further details (a full implementation) of the efficient algorithm and structuring the proofs in a language more attuned for computer scientists (versus mathematicians), requiring fewer theoretical prerequisites. See here, here or here.
- Completed: **Strategic Play in Stable Marriage Problem** (2016 Aug). See here or here. Discussed in a very rough form a host of results pertaining to the Stable Marriage Problem, including applications thereof.
- Completed: **Dealing it multiple times does not change the expected value** (2015 May). Discusses how the common practice of dealing the turn and/or river multiple times in holdem poker games does not change the player's expected value. Implies that random samplings of this type can be performed without substitution (applicable in A/B tests). The proof involved two innovative steps. See proof here and here and code sample here and here.
- Completed: **Project: Success Probability Calculator** (2015 April). Presents the implementation of an O(n*m) method for identifying the optimal investment strategy to achieve a target single-currency

bankroll starting with some capital, choosing one of m investment options over n time periods. The project involved using of some more advanced data structures such as an efficient LRU cache implementation and a Space vs. Time Tradeoff Structure. See details here and source code here or here. The code sample includes an efficient LRU Cache implementation and other helper structures.

- Completed: **Choosing a Gamble with Best Expected Value is often a bad strategy in Stochastic Games** (2014 Aug). Argued by example that this is the case. See details here (in Romanian).
- Completed: **A Game of Ultimatum – Surprising Results of Rational Play** (2013 Dec). Inspired by a 2013 lecture by negotiation expert Moty from Moscow School of Management SKOLKOVO, a particular 3-player general-sum game of ultimatum was examined, leading to surprising results. See details here (in Romanian).
- Existing Topics Known: Two/Many Player Zero-Sum Games, General Sum Games, Kernel of a Game, Nash Equilibrium, Discrete Stochastic Games, Sprague-Grundy Numbers, some intractability results, etc.

- **Algorithms and Data Structures**.
  - In pipeline: **Adaptive Topology in Distributed Solving of Sorting Problems** (~2023). Introduces a O(m*log n) network time + O(n*log^2 n) external time method for distributed sorting, involving a dynamic, adaptive network topology. While the O(m*log n) bound is matched much simply by the MM algorithm using sorting networks, the approach of adaptive topology is judged to be of general interest and the method is presented as an inspiration for other researchers to examine this kind of approach. Ideas for this paper have been fully developed.
  - In pipeline: **Sub-linear Time Routing in Urban Networks** (~2023). Introduces an efficient method, based on smart precomputation to support queries of the form "shortest path from A to B" in graphs representing Urban Networks, which should run much faster than Dial's algorithm and A*.
  - In pipeline: **Memory Efficient Van Emde Boas Data Structure** (~2023). Combines a vEM Tree with a Universal Perfect Hashing scheme to obtain an expected time O(log log U) INSERT / DELETE / FIND / UPDATE / MIN / MAX / PREDECESOR / SUCCESOR data structure with only O(n) memory for n queries of keys in the universe 0..U. This improves on vEM Trees in terms of memory consumption from O(U) to O(n).
  - Completed: **Shortest Path in a Weighted Graph with Small Edge Costs** (2003, GInfo). An independent rediscovery of Dial's algorithm O(V+E*C) and the brief presentation of a method to further reduce complexity to O(V+E*log log C) using a vEM Tree. Neither Mircea Digulescu, nor the reviewer from GInfo, were aware of Dial's algorithm at the time (which is so obscure in literature that finding it on Google Scholar is still unsuccessful as of Feb 2021).
  - Completed: **Kirkpatrick's Algorithm** (2003, Ginfo, with Andrei Matei coauthor). Presented the famous Kirkpatrick Algorithm and Data Structure for efficient point location in the plan using successive triangulations.
  - Other independent rediscoveries: **Kosaraju's Algorithm**, **Fisher Yates Shuffling Algorithm**.
  - Existing Topics Known: Mircea Digulescu is a recognized as an expert on Algorithms and Data Structures. He is familiar with the following: **AVLs, KD-trees, Interval and Segment Trees, B-trees, AB-trees, Orthogonal Range Queries with Fractional Cascading, RMQ, LCA, Binary Heaps, Binomial Heaps, Fibonacci Heaps, Universal Perfect Hashing, Disjoint Sets, KMP, Rabin Karp, Dijkstra, A*, Bellman-Ford-Moore, Floyd-Warshall, Dial, Egg Dropping, Network Flow – Floyd-Fulkerson and Lift to Front, Paxos** and many, many others. Also, besides knowing and understanding these algorithms (some of which he independently discovered while reading Cormen CLRS when he was 15-17 yo), he is well apt to apply them, with a vast industry experience and over 320 problems solved on Codeforces.com, where he is a Div1 coder: **mircea85**.

Additionally he solved many non-research problems from the Cormen CLRS and Knuth TAOCP computer science books.

Besides being interested in obtaining financing to continue research as per his interests above, Mircea Digulescu is also interested in partnering with someone for **coauthorship publication** (in recognized peer-reviewed journals), **Translation** of results in another language and **Dissemination** of said to appropriate recipients, with proper attribution.

Mircea Digulescu is also apt to **teach or train** on topics including **advanced Computer Science**, both based on his own research interests and results, as well as at the Master's (for example covering the material of MIT Advanced Data Structures) and at the Bachelors' levels (for example covering MIT Introduction to Algorithms or the entirety of Cormen CLRS book, including exercises). Additionally he can teach or train on **Software Engineering**, including writing clean and maintainable code, fundamental DevOps, code reviews, architectural and design patterns and building or using Cloud services, like AWS SQS or Redis.

Mircea Digulescu's computer science and education credentials include:

- Div1 coder on www.codeforces.com – roughly in Top 0.3% best of the best coders of all time world wide - http://codeforces.com/profile/mircea85 - highest score 2022, **candidate master**, with over 320 problems solved (NB: I continue training here, so current rating can vary).
- Codility Golden Award for the Calcium 2015 Challenge – 2015 – see here.
- 10th place at the *ACM ICPC Southeastern Regional Contest* - 2005
- 4th place at the *ACM ICPC Southeastern Regional Contest* – 2004
- 1 Bronze Medal *at European International Olympiads in Computer Science* (CEOI) - 2004
- 1 H. Mention at *European International Olympiads in Computer Science* (CEOI) - 2003
- 3rd prize at the *Romanian National Computer Science Olympiad* – 2004
- 3rd prize at the *Romanian National Computer Science Olympiad* - 2003
- Multiple prizes at other lower-level Computer Science and Mathematics Olympiads and contests

Teaching Experience and Education:

- **University of Bucharest - Faculty of Mathematics and Computer Science –** *Doctoral Studies in Applied Computer Science* – 2014 - 2019 PhD (ABD) completed. Main contributions related to Stable Marriage Problem and to Distributed Sorting. I encountered heavy resistance at getting my work published in indexed peer-reviewed journals – for matters of form - not lack of correctness or relevance, which lead to delays. Finally, in summer of 2019, after completing all work except dissertation, I withdrew from the PhD program in order to get my diplomas. I thus graduated ABD – all but dissertation (for which indexed publications were required).

Facultatea de Matematică și Informatică

- **Trainer at Academia Credis (IT Training) –*Java Basic*** (2017): I taught the Java Basic course to a class of about 15 adult students as a side job, more out of passion and my desire to learn Java as well. This was an on-site, in person project, during evenings. I earned 1000 EUR for the month-long course.
- **Assistant Professor at University of Bucharest - Faculty of Mathematics and Computer Science (Romania's top University - http://fmi.unibuc.ro/)** (2014)**:** I taught Object Oriented Programming (OOP, C++) and Formal Languages and Automata (LFA) courses, holding lectures, providing hands-on assistance, creating and handing-out workouts, providing written and oral feedback and generally developing specified aptitudes. I had a great time and all of my students got excellent industry positions later on. I had a great time teaching. I earned about 350 Euros / month while working here.

- **Train of Trainers Course** (2014) at Frends. Completed this program at the invitation of a friend at the time. Frends is a volunteering non-profit, associated with University student groups and student life.
- **National Students' Congress** (2013) – Palace of Parliament (Bucharest) – Speaker. I blabbered a bit about some irrelevant educational topics. Was invited there by surprise.
- **Softbinator Tracing the Roadmap Conference** (2012) – Romanian National Library (Bucharest) – *Speaker.* I spoke on topics of Entrepreneurship and explained the value in having a vast number of autonomous economic actors, versus dealing with an oligopoly.
- **University of Bucharest - Faculty of Mathematics and Computer Science –** *Master's Degree Software Engineering* (2008-2010). Dissertation thesis "Resource Sharing in a multi-process, multi-transaction environment", Merit scholarship during 1st year.
- **University of Bucharest - Faculty of Mathematics and Computer Science** – *Bachelor's Degree Computer Science* (2004 – 2008). License thesis "CryptoSafe" – a WinRar desktop application which encrypts data with AES instead of compressing it. Merit scholarship during 1st year.
- **National Computer Science High-school "Tudor Vianu"** – *Baccalaureate, High-school Degree* – (2000 – 2004). During high school I joined fashion of taking SAT tests (1400 SAT1, 1800 SAT2 Math IIC, 1730 SAT2 Physics) and applying to US University, and I was offered admission at Cornell University but never joined - declined eventually due to financials mainly.
- See further relevant details in Section 2 (above).

See Mircea Digulescu's publications and profile on Academia.edu here and on arXiv.

Mircea Digulescu also has the competence to teach or train on topics of Leadership, Strategy, Intelligence, Business Administration, Organizational Architecture, as well as others.

4. Software Engineering by Mircea Digulescu

Mircea Digulescu is a software engineer, engineering leader and manager. He has ample experience with a number of customers across different verticals (**Finance, Government, FinTech, OnDemand, Media, Healthcare** and, of course, **Tech**). He is easy to interact with from the customer side, including beneficiaries, managers, executives and owners, autonomous and effective at understanding and clarifying requirements, even in the presence of ambiguity and can lead teams to speed up the software development process. Most of his customers approach Mircea Digulescu for the following:

- **Building systems that scale**. Performance and resiliency are key aspects of systems developed. Choosing the proper system architecture, implementing (and potentially discovering) the proper algorithms to apply are key to the success of such a project. Mircea Digulescu can build systems that serve more than 1 Billion monthly active users with over 1 Trillion transactions per month. He can also build near-real time and – with proper hardware – real-time systems.
- **Building substitutes for Cloud technology** or **Expanding existing Cloud technology**. Mircea Digulescu has the technical know and is savvy to rewrite and expand / improve products which substitute existing Cloud services, such as **AWS SQS, SNS, S3, Redis, SQLLite** and **many others**. He can rebuild such services from absolute scratch, or use existing open source repositories (eg. Kafka, Redis) to speed up delivery. He can also build non-standard components, suited for a particular use. This is

especially handy for building Private Clouds and for solving concrete engineering problems for organization which do not want to or cannot host their applications on public clouds or use open source technology (for example for security reasons).

- **Solving difficult and open-ended (undelimited) engineering problems**. Besides run-time performance, many companies require that problems for which it is inherently difficult to arrive at a solution be solved. For example, for Bolt.eu (European Uber/Yandex Taxi), Mircea Digulescu developed the technical architecture to provide them with their own version of Google Maps, including deducing traffic patterns and congestion from existing GPS data from their drivers on the roads. This allowed the company to save many millions in annual costs and gain strategic independence from Google. He did this based on the paragraph-long requirement: "We need to have an independent alternative to Google for routing."
- **Performance and Accuracy Optimization**. For companies that already have existing products or code-bases, Mircea Digulescu is usually called upon to make them actually work – either making them run acceptably fast (or blazing fast as a competitive advantage sometimes) or improving the accuracy of the data they produce or the way they function.
- **Big Data Analysis and Process Automation**. When data volumes get large, most "standard" software engineers become overwhelmed and try to improvise some shaky system using open source components, coupled together in way that either doesn't work, or doesn't work well enough. Mircea Digulescu offers and implements solutions that live up to the required **performance**, **reliability**, **automation**, **accuracy** and **ease of use** requirements, while leveraging existing investments as much as possible.
- **Building Reliable and Resilient Systems (Enterprise or otherwise)**. When a "standard" system needs to be built with confidence that it will function as desired, be easily scalable in the future and adequate, Mircea Digulescu can architect and implement it, confidently within a fraction of the time it would take others to do this at an acceptable level of quality, should such hypothetical others ever succeed.
- **Fixing the hard stuff**. Sometimes even systems with a long history of running in productions have undesired traits (bugs) which have baffled engineers for a long time and which have since become critical to fix. Mircea Digulescu can save the day in such a time.

- **Full Technology Lifecycle – DevOps from inception to decommissioning**. Software systems, like most hi-tech systems (eg. ICMBs), have a lifecycle which goes far beyond the first production launch. It includes doing patches, upgrades, migrations, integrations and so on, all while maintaining the system operational and ensuring the integrity of the data. Organizations can get all these problems off their minds, by delegating ownership of the entire lifecycle to Mircea Digulescu. This includes human interactions with technical teams and team-leads/managers as well as IT systems.
- **Managing Engineering Teams**. Mircea Digulescu can create and leverage an effective tech culture (similar to big companies like Google, etc.) where people are excited about and productive in their work. Also, he can adjust and perfect such a culture to apply to the demands of a startup – including cutting corners for faster TTM, handling morale, keeping sponsor execs up-to-date and in the loop, and many others.

Mircea Digulescu considers himself a **language agnostic programmer**, with a **dual Computer Science and Engineering background**, apt to work on any tech-stack suitable or required for a project or product. He already has professional (paid) experience with the following tech-related stuffs: **C#, C/C++, .NET, TypeScript, JavaScript, Java, SQL, Microservices, BlockChain, AWS SNS, SQS, ElastiCache, RedShift, CloudFormation, MSSQL Server, Oracle, MySQL, Redis, RabbitMQ, Spark, GIT, Git Workflow, BitBucket, Cryptogprahy, TCP/IP, HTTP, REST, Cognos, Oracle OLAP, Informatica (BPMS tool), Microsoft Teams, JIRA, Jenkins, ASP.net, WinForms, WCF, MVC, MVVM, Kibana, Graphana, Docker, Akka.net, ReSharper** and many others. His best-preferred programming language is C# and his second-best preferred is TypeScript. Mircea Digulescu builds maintainable, extensible systems, emphasizing code quality, component reuse and clarity.

Mircea Digulescu is also considering expanding into Machine Learning, AI as well as embedded systems.

Mircea Digulescu's portfolio of past projects includes, but is not limited to the following:

- **Bolt.eu (then Taxify.eu)** https://bolt.eu (2018-2019). Bolt.eu (then Taxify) is the European ride-hailing and on-demand tech services provider, competitor to the US Uber and the Russian Yandex Taxi. The personal technical contribution for Bolt.eu included determining the architecture of system to function as an internal competitor to Google Maps for routing drivers to riders and computing Estimated Time of Arrival (ETA), based on OpenStreetMap and the GPS location points collected from the drivers, and performance-optimizing the Spark jobs part of the dataflow. It also included writing the Redis scripts for fast computation of a location suggestion service (guessing where the riders wanted to go) based on several signal sources and heuristics, obtaining O(1) performance and 95% accuracy. The third important task was writing from scratch a driver-rider matching module, emphasizing performing as many mutual acceptable matches as possible, using the Min-Cost-Max-Flow algorithm based on Ford-Fulkerson method. Additional projects included corrected technical decisions for a compliance reporting project for the Australian gov't and another data intelligence one for marketing. These are all production systems, running currently with **over 100 million active users**, and **over 10 Billion monthly transactions**: when you open the Bolt.eu app to order a ride, the automatic destinations suggestions, the ETAs you see for the pickup and drop-off, as well as the very driver which is assigned to you, all go through systems technically built by Mircea Digulescu. I earned 17,000 Euros/month for 12 months on this onsite role.

- **Collective2** https://trade.collective2.com (2017-2018). Collective2 is a "poor man's hedge fund", democratizing investing by allowing small individual investors to discover and automatically duplicate – for a fee –, strategies of top traders on capital markets, especially stocks and derivatives. I developed the entire reporting infrastructure for them, including retrieving, caching and serving historical Stocks, Derivatives and FOREX quotes, determining VaR MTM value of portfolios, integrating live quotes, all culminating with an accurate and responsive P&L service. All this was technically interesting work, involving SQL query design and optimization, Database Connection Pooling, Cache Eviction Strategies, Service Monitoring, as well as financial domain specific knowledge, useful for implementing an Option Settlement Calculator and many other details. The work was particularly challenging since the client was a startup, and thus did not want to take the costly alternatives using high-priced historical and live quotes services that most hedge-funds and banks take. While the title was Senior Software Engineer, I was working directly with the company founders. I earned $6,500 USD/month for 7 months on this remote role.

- **Hearst** https://www.hearst.com (2019-2020). Hearst is a western international media conglomerate, the creator, among others of the blockbuster western film The Avengers. My project was for their IT Services department. It involved fixing, modernizing and automating some workflows, mainly pertaining to flow of financial data concerning reimbursements from PeopleSoft into Concur and then Cognos. The project entailed creating a new SQL data model and C# tasks, all while working with stakeholders, users and third parties to correct and remake

the flow properly. Automation tools like Informatica were also employed. My title was Technical Architect. I earned $11,900 USD/month for 7 months on this remote role.

- **Cegeka** https://www.cegeka.com (2014-2015). I did performance optimizations and stability fixes for their Cegeka Care healthcare / nursery homes product mini-ERP system, which the existing team was unable to tackle after months of trying. In doing this I reduced the web system's loading time from >1 minute to 2-3 seconds, and the per-page loading time of heavy pages from 30-45 seconds to about 4 seconds. An interesting part of the technical solution involved implementing an Euler walk of a housing units tree to allow O(1) is-ancestor queries, directly from SQL. Project was in C#/MSSQL/ASP.net. My title was Senior Software Engineer. I earned ~2500 euros / month while working with them, for 3 months. Project was on site.

- **Societe Generale** https://www.societegenerale.com (2016). I worked on a desktop application which is used by traders to trade on markets, especially stocks and derivatives. I implemented a filtering module for financial instruments and provided the technical solution for an efficient Options' financial curves evaluation module which integrated with their VaR portfolio evaluation module. I also did other fixes and enhancements for this Front Desk trading tool, which allowed traders to perform both manual and automatic tasks, such as hedging, automatic trading, etc. Even now, billions of euros in trade goes through the modules I have built. I earned 2200 euros / month while working with them, for 9 months as Senior Software Engineer. Project was on site.

- **Finastra (then Misys)** https://www.finastra.com (2017). Finastra (then Misys) is a global firm developing software for the Banking System, having more than 90% of the top 50 banks as customers. My responsibilities involved performance optimizations and stability fixes on their core Summit product. Received excellent feedback from both customers and management. I learned a lot about core banking operations, including financial products for Money and Capital Markets. I earned 3000 euros / month while working with them, for 5 months, as Technical Lead. Project was on site.

- **BNR (working for SIVECO)** https://www.bnr.ro (2005). While working for SIVECO Romania I did an Analytics and Business Intelligence project from scratch for the Romanian National Bank. The project involved collecting, processing and serving data for two main areas: financial supervision and banking stability. I was involved in operating the 2005 stress-test of the banking sector which identified banks vulenarble to financial shocks such as the upcoming 2008 financial crisis. I also got acquainted with modern money mechanics and the then-in-effect Basel II standard. I earned 700 euros / month while working here as Software Expert, for 3 months for this on site role.

- **CNAS (working for Siveco)** http://www.cnas.ro (2006). While working for SIVECO Romania I did an Analytics and Business Intelligence project from scratch for Romanian National Health Insurrance House. It involved mainly analytics and projects over consumption of medicine, both for planning and fraud detection purposes. I learned that the Romanian population had overall a rather large consumption of medicine. Project was on site, during the period of time when I was Product Manager at SIVECO Romania – they generally used me to show credibility to the beneficiary and streamline signing of acceptance papers for the >$10 million multi-annual software project. I earned 700 euros / month while working here, for 2 months, on site.

- **Mat Soft Technology** http://www.matsoft.ro (2009-2014). While bootstrapping and benefiting from a small investment, I designed the technical architecture and implemented a few modules in an ambitions Private-Cloud integrated system, commercialized as a BPMS tool. I was also technically leading a team varying from 3 to 10 people. From a commercial perspective we were a Robotization Process Automation (RPA) company. See details about the product and the phase to which it was bought here: http://www.matsoft.ro/index.php?sectionId=108. The concept is largely the same as that of later successful Romanian "unicorn" UiPath https://www.uipath.com and US intelligence company Palantir https://www.palantir.com. The technical work was pretty advanced, but the small size of the investment did not allow it to be all completed in that go. I

worked as CTO, Chief Architect and Software Expert essentially; all while fulfilling CEO duties as well. Project was in C#. I did not earn money while working here, but was instead bootstrapping and spending my own savings.

- **DevFactory** https://devfactory.com (2018 and 2020). DevFactory is a large IT conglomerate which is a terminus points for many small startups which fail to self-sustain. The role involved discovering, fixing and improving the technical architecture of the products of such companies and finding ways to integrate them into existing portfolio. Work was of an elite level (moderate technical depth though), focusing on the AWS cloud services, like AWS SNS, SQS, SendGrid, ElastiCache, Cognito, Secrets, CloudFormation, etc. One project involved architecting a responsive Contact Tracing App system scaled globally (billions of users), which can be used during pandemics or wrt to people handling secret information. I earned $16.000 USD / month while working with them, for 5 months in total, on this remote role.
- Mircea Digulescu also received Senior Software offers from Google (2011 and 2021) and Amazon (2019) – which is a true attestation of his skills. He declined however, since they didn't pay enough and imposed travel restrictions.
- See also: Menus Demo Project. This is a project done a while ago as a Demo to demonstrate my full stack skills. See source code here and here. Mircea Digulescu's GitHub ID is **mircead85**.
- See further relevant details in Sections 2 and 3 (above), including University credentials.

The single most important thing all his prior customers and beneficiaries would say about Mircea Digulescu is that **he delivered where others didn't**; that they can entrust him with a problem and have the confidence he will get it done (i.e. "fire and forget" approach).

5. Societal Architecture Research by Mircea Digulescu

Mircea Digulescu wrote and writes on topics of societal architecture, both prospective and current. His views can be approximately described as **leftwing republican libertarianism**. He is against assassinations. He supports strategic armaments, especially nuclear, but is against biological weapons.

Mircea Digulescu considers the state an alliance of people, much more than a monopoly on physical force. His views core values, both personal and in terms of design of a better society are **Truth**, **Liberty**, **Justice**, **Tolerance** and **Love**.

The concrete materialization of Mircea Digulescu's ideology, particularly in the context of actual practice, given the current state of world affairs is still the subject of ongoing research by himself.

Mircea Digulescu's social writings additionally aim to educate the youth into properly understanding their socio-economic reality and empowering them with the competence to detect and avoid manipulation and informative intoxications. It aims to give them the core societal skills "that no one teaches them in school", to strengthen their cognitive and emotional autonomy and nurture their lucidity.

The following articles are published by Mircea Digulescu or in pipeline, pertaining to societal topics:

- In Pipeline: ***On Love and Happiness – Part 2*** (~2025) – in Romanian. Represents the follow-up to the 2015 paper, where happiness and love are explored under an optimistic societal scenario. Represents the culmination of Mircea Digulescu's works on society, in terms of incentives for bettering it and completes his work in this regard.
- In Pipeline: ***Secret Societies – How to build, join or operate one*** (~2024) – in Romanian or English. Discusses how social change and secret or dissident societies can be set up and operated effectively, in a hostile environment, at various stages of development.

- In Pipeline: ***The State of Paradise – How a better society looks like*** (~2022) – in Romanian or English. Presents of what are the day to day life, activities and options of individuals living under a societal organization the author considers better. Presents areas of potential conflict and how these will be handled. Discusses state survival against external, internal and mixed threats.
- In Pipeline: ***How we ended up here: An alternative view of Human History and Future*** (~2022) – in Romanian or English. Discusses the evolution and dynamics of human society from early humans up until present day, countering myths and attempts at deception. Discusses how the future will look like under two scenarios, including the risk of a split of the human species into a super-species, enhanced biologically via technology and all-powerful.
- Completed: **On the Functioning of Society** (2019 July) – in Romanian. Presents non-trivial truths about how present day society works, and dispels common myths. Highlights the importance of investing in security and discusses the decisive role of secret societies. Raises an alarm with regards to future disempowerment of the general population, leveraged by advances in technology. See here, here or here.
- Completed: **On Happiness – Part I** (2015 May) – in Romanian. Proposes a comprehensive approach to human happiness, particularly in the context of societal design. Presents a parallel between the present day system and a better society with regards to how various aspects related to happiness are covered. Places particular emphasis on Self actualization and Love, particularly in terms of such as a source of internal drive and power. See here, here or here.
- Completed: **On Liberty** (2013 September) – in Romanian. Dispels common myths in the sphere of individual and collective liberty and introduces a small set of fundamental liberties to be enacted and safeguarded as part of a better society. Proposes a formal framework for reasoning about liberty and discusses its connection with Morality. Also discusses Liberty form a historical perspective. See here, here or here.
- Completed: **On Morality** (2012 November) – in Romanian. Formalizes Morality in terms of human cognitive behaviors, discusses the formation of moral systems, including from a historical perspective, dispels common myths and prejudices about morality and proposes a rudimentary system of moral values. Discusses transmission of moral values as Memes and presents non-trivial truths about Morality. In the context of this paper, Morality is viewed with an emphasis of justice and legitimacy, not as a matter of judging taste or adequacy of controversial legitimate behaviors. See here, here or here.
- Completed: **On Power** (2012 May – a) – in Romanian. Educates about what the actual sources of power are and how to model the flow of power in society within Game Theory. Leverages concepts learned during the MBA studies. See here, here or here.

Mircea Digulescu is doing these writings as a hobby.

6. DIRECT COOPERATION

Mircea Digulescu can function as part of a **strategic think tank**, or he can directly lead an organization tasked with solving problems technically, at a local, regional, district or central level.

He can might make strategic and IT contributions, similar to the US start-up which developed overwhelming tactic for air-to-air dogfight combat between jets using Machine Learning and AI principles, defeating all human opponents, including some with decades of combat experience.

7. JUST FOR FUN WRITINGS

Mircea is to be a SciFi writer, leveraging inspiration from his own life in his works. His best target audiences are mainly educated people or people capable of completing higher education but not only. His style is original, with slight influences from James Clawell, Alexandre Dumas and Donald Knuth.

Contact: mircea.digulescu@gmail.com **(preferred)**; mircea.digulescu@matsoft.ro. **Tel/WhatsApp +40729.276.435.**

He already wrote a belletristic mathematical work called "Explanation of Love" (2013) – in Romanian, which was rather well received by its target audience. See here, here and here.

His second and main work will be a SciFi love novel, inspired by some of his real-life adventures and thoughts, called "The Little Big Game of Life": a 3-part story about a He and a She who love each other and are torn apart by the world in which they live, gradually discovering themselves and their reality and eventually ending up saving the Universe a total number of two times. The fictional universe of the book will gradually change from present day mundane to something like that of Star Trek The Next Generation and beyond.

He does this as a hobby.

8. START-UP PROJECTS BY MIRCEA DIGULESCU

Based on his comprehensive experience and technical competence Mircea Digulescu is confident to propose setting up startups on the several ideas. He is currently looking for customers and financing up to self-sustainability from sales for these startups. Additionally he is looking for partners in complementary areas of activity for mutual promotion and creation of synergies. Ideally, he will found all these startups, as part of an umbrella group of his, since they all have merit. He is in it for the long run. Ideally, he would be leading all these companies at the strategic level and as CTO, doing of them in parallel, should raised financing allowed for proper additional staffing.

- **MarketZero**. This is an online marketplace where economic actors can issue "financial" instruments promising their production of goods / services for up to 5 years in advance. They can also declare instruments they want to buy. This way, entire economic circuits can be formed without the need for banks to finance the independent actors. For example, a vegetable producer can sell long on vegetables for delivery in his town/region and buy long on home maintenance services from another. This way projects and economies can self-finance in a barter-like manner, which only a minute fraction of the fiat currency usually involved, for external services. The market place will function as (i) a reputation management system; (ii) a discovery facilitator: based on the individual buy/sell interests for good/services of individual actors, the system can do matchups and suggest circuits which can be formed; and (iii) as a trust agent for people to use the system. The data, bids and transactions themselves will be operated on a geographically and politically distributed block-chain (like BitCoin or Fluence). Different actors, such as escrow agents, can surface and join this system, getting paid in the currency of the block-chain, in the financial instruments issued by the actors or in fiat currency. Why valuable to us? The owner of the system can obtain revenue via ICO, commissions on transactions, or discovery services. He can also gain significantly from Ads placements. Finally, he will have extremely ample and detailed knowledge about the configuration of the market – which can then be analyzed with automated tools. Why have Mircea Digulescu do this? Because he (i) has the required leadership and technical skills to deliver a proper, useful, effective and desired solution that scales and is secure from threats; (ii) has the strategic competence to operate such a system initially so as to ensure its growth (with adequate financing); and (iii) has the background and image which will garner trust from independent actors to use the marketplace.
- **Crypto4Real**. There are a lot of crypto tools, protocols and systems out there – some free, some not; some open-source, some not. However, most of them don't work: they don't ensure in practice the security guarantees which they promise. Crypto4Real will offer tools, systems and services to facilitate a number of common and not-so-common crypto scenarios: (i) full disk encryption that actually works, in the context of spyware, cyber attacks and… Windows OS; (ii) authentication and authorization; (iii) dedicated crypto systems for special work customers; (iv) secure communications, including an end-to-

end Signal-like messenger; (v) potentially a block-chain / public cloud based, encrypted hosting and serving solution, suitable for stuff like emails, video streaming, etc. and (vi) tools for automating communications in hostile environments, including over free web services, and stenography. Why valuable to us? The owner of the system can obtain revenue via sales or licensing partnerships for the tools in questions. Additionally such a successful endeavor will entail marketing benefits, facilitating gathering of momentum for the other startups. Why have Mircea Digulescu do this? Because he (i) is deeply savvy on crypto, has invented a novel cryptosystem himself (See Section 3) and knows most of the things that can break a crypto both theoretically and in practice; and (ii) has the background and image to garner trust from other parties to consider his tools.

- **MAT Soft Intelligence**. The idea is as straightforward as it gets: a company similar to the US RAND Corporation or Palantir.com, which will leverage both IT technology (mainly internal) and general intelligence and wisdom to process, analyze and derive insights from data collected by, or on behalf of its customers. The target customers will mostly be state actors or similar. Why valuable to us? The owner of the system can obtain revenue via sales of solutions and doing up to billion dollar projects. Internal technology and methods can be reused from project to project. Can become an intelligence broker itself. Additionally, the nature of the activity will favor affluence for the persons involved with this company. Why have Mircea Digulescu do this? Because he (i) he has both the technical skills, the research results and competence as well as a range of practical field experience in intelligence; (ii) has the necessary leadership and conversational skills to deal with the potential customers and ensure counterintelligence across the internals of such a company and (iii) will be a "locomotive leader" of such a company, able to single-handedly solve most difficult problems arising across projects, as well as complete some initial projects himself.
- **TuringAlpha**. This will be for algorithms and computer science in general what WolframAlpha.com is for mathematics: namely a service where customers can submit data and get back the result of its processing via some algorithms (which could be kept secret from them). Some algorithms could be interactive, resulting in an ongoing service between customers and the TuringAlpha servers. Example of applications include: Computing solutions to Optimizations Problems, like 3-CNF-SAT based ones, training and providing Machine Learning models for specific purposes (eg. drone combat situations, deep-fakes, etc.). See Section 3 for specific research contributions by Mircea Digulescu which can be potentially practicalized for this purpose. Contingent on success of ongoing research, it could be that TuringAlpha is also shielded from being able to see the data on which it operates, leveraging Turing-complete functional encryption. Why valuable to us? The owner of the system can obtain revenue via sales of services and subscriptions, or tier upgrades. Additionally such a system can form the basis of a platform and a community with many elite users and partner research and special institutions. Why have Mircea Digulescu do this? Because of (i) elite scientific skills required to make the system offer meaningful services; (ii) elite engineering and leadership skills required to build such a system at scale and (iii) deep understanding of IT needs across existing field, useful in garnering initial momentum.
- **PeerReviewMe**. A portal and mini-social network similar to ResearchGate.net and Academia.edu where established and independent scientists can share scientific work and collaborate with each other. Additionally to the features available on these platforms, there will be a **paid peer review** system, which will allow fresh scientists to break the monopoly of western-controlled closed-circuit publications and obtain proof of correctness, topic-classification as well as potentially degree of novelty and/or similar works without the politics involved with the former. Unlike other "pay to publish" schemes, the peer-reviews will be community available so that any scientist can make an informed decision – they will also be rated and reviewed themselves. There will be no bias neither for positive nor negative review, since these will be public and technical in nature (neutral). This will essentially disrupt large

scale publishers such as Elsevier and open the door to many talented and aspiring scientists to contribute to research, monetize domain knowledge by doing reviews and to establish a personal reputation. Why valuable to us? The owner of the system will essentially hold data and influence over a top community of valuable established, independent and aspiring scientists. This can be monetized via Ads Placements, commission fees and tier upgrades. Additionally, very importantly – the system can be used to source and recruit top personnel for a particular domain, and screen away the 99.9% who would not be adequate, be it that they have former credentials or not. Finally, the owner of the system can process the data for Analytics purposes. Why have Mircea Digulescu do this? Because of (i) he can adequately spec out the details which will make or break such an idea; (ii) has the elite engineering and leadership skills required to build such a system at scale and (iii) can generate the goodwill and interests from both sides of the spectrum in such a system.

- **MAT Soft Systems**. A company to develop, market and support integrated systems useful in disaster relief, emergency and in other situations. This builds upon the experience of building on-demand systems (such as Uber/Bolt/Yandex Taxi are doing), and taking that several steps forward, adding collaboration tools and modules for specific types of tasks. In the context where combat drones of different characteristics and functions, and swarms thereof become more prevalent in war fighting and the technical efforts involved in such operations become more and more automated, up to the local / regional HQ level, such a system is a must for the 21st century. Why valuable to us? Same reasons as for MAT Soft Intelligence. Why have Mircea Digulescu do this? Same reasons as for MAT Soft Intelligence and, additionally his elite technical and leadership skills which will enable him to architect and build such a system that is fast, secure, reliable and which scales.
- **MAT Soft Private Cloud**. A company just like AWS (Amazon Web Services) or AlibabaCloud, except that instead of hosting all its services internally, it provides the required software tools and services for customers to build a self-hosted cloud infrastructure, and to operate it properly. This idea can be partially combined with all the other ideas above since they all leverage as well as provide specific software services which can be run in the Cloud. As a future strategic option, such a Cloud could of course have a public variant, just like AWS, becoming a competitor in that sphere as well. Why valuable to us? Can be monetized by charging for software to operate the private cloud, and potentially for projects synergic with MAT Soft Intelligence / MAT Soft Systems. Additionally, it generates reputational benefits and presents the advantages of having a community develop around this platform. Why have Mircea Digulescu do this? He (i) can quickly select the proper mix of open source software for a quick start (not to reinvent the wheel) and then enhance / adapt them, as well as develop such from scratch; (ii) has the elite engineering and leadership skills required to build such a system at scale and (iii) has the scientific know to make such a system differentiate, particularly by including features similar to the TuringAlpha idea above, as well as crypto that works.

Mircea Digulescu is currently actively seeking Seed and Series A financing for each of the above startups. He is also looking for a strategic partner who can support financing for setting up the umbrella group to do all these. Additionally he is actively looking for potential customers which are interested to partner with or acquire software and services from any these future companies.

See Sections 2, 3 and 4 above for further details on what recommends Mircea Digulescu as an entrepreneur and leader for making these startups into a series of successes.

The Emotional Part of the Story

Mircea Digulescu knows he is not perfect. He continuously strives to improve one self and show modesty besides skill in all occasions. He understands he can be controversial at times and, while not forgetting

about himself, seeks accords which are desired by all parties involved. Nevertheless, he considers the potential for cooperation and achievement by far outweighs any potential challenges by several orders of magnitude.

Mircea Digulescu is also interested to work together with his clients on **any kind of related initiatives** they may have in any sphere. Please schedule a call or a meeting now by contacting Mircea Digulescu at:

- Telephone/WhatsApp: **+40729.276.435**.
- Email: mircea.digulescu@gmail.com (preferred); mircea.digulescu@matsoft.ro.

NB: **MAT SOFT** is a brand by which **Mircea Digulescu** is known in Romania and other countries. The name MAT Soft Technology, distinct from MatSoft is the name of a company he founded in 2009 and sold in 2014.

"Perhaps the main reason why we are chosen over our competitors lies in our motto: We succeed where others fail; we deliver where others deliver excuses. While delivering is the single most important aspect, we also emphasize good communications and friendliness in our relationship with beneficiaries."

– Mircea Digulescu (Managing Partner)